Distribution: $\rho(x) = a \cdot e^{\frac{(x-b)^2}{2c}}$

Values from the numerical simulation:

$a = 0.036039 \pm 2.8\text{e-}05 \qquad b = 19.834 \pm 0.01 \qquad c = 122.86 \pm 0.22$

Values from the theoretical approach:

$b = \langle x \rangle = (2p-1)Ml = 19.99 \qquad c = \sigma^2 = l^2[M - (2p-1)^2] = 99.96$

$a = \frac{1}{\sqrt{2\pi c}} = 0.039$